

Severe Weather Awareness Week

FEBRUARY 20 - 26, 2000



National Weather Service Warning and Forecast Offices

Morristown Tennessee

Nashville Tennessee

Memphis Tennessee

SEVERE WEATHER AWARENESS WEEK

February 20 - 26, 2000

Governor Don Sundquist has proclaimed **February 20 - 26, 2000** as "**SEVERE WEATHER AWARENESS WEEK**" in Tennessee. The National Weather Service, Tennessee Emergency Management Agency, and other supporting organizations ask your help in providing the public with information about severe weather safety. Advance planning and increased awareness will help you survive these deadly storms.

Throughout the week, the National Weather Service, Tennessee Emergency Management Agency and other supporting groups will conduct educational activities and drills to help people prevent injuries and deaths from tornadoes, damaging winds, flash floods, lightning, and hail. Each day of the week focuses on a specific type of severe weather or on the warning and drill system.

Monday, February 21 begins the work week with a look at **Severe Thunderstorms**. Damaging winds from severe thunderstorms are much more frequent than tornadoes in the Mid-South. These straight line winds can reach well over 100 miles an hour and can be devastating.

Tuesday, February 22, will focus on **lightning**, one of the underrated killers. All thunderstorms have lightning and this hazard can be deceptively deadly.

Wednesday, February 23, will emphasize **Tornado Safety**. Over and over again, people survive tornadic weather by knowing weather safety rules and taking appropriate and timely actions. A **state-wide tornado drill** will be conducted on this day. Schools and state, county, and other interested agencies are encouraged to participate and help everyone learn life saving rules. Friday will be the alternate drill day if adverse weather is expected on Wednesday.

Thursday, February 24, draws attention to hazards of **Flooding and Flash Floods**. Flooding is the number one weather killer in the United States. Flash Floods are most prevalent in the east half of Tennessee while River Flooding is more common in the western sections.

Friday, February 25, will be the **NOAA Weather Radio and Emergency Alert System Day**.

From the Meteorologist in Charge Jerry O. McDuffie

As we begin this year of 2000, the Warning Forecast Office in Morristown, Tennessee is beginning its 6th operational year in support of the people of East Tennessee, southwest Virginia and extreme southwest North Carolina. Many changes have occurred during these 5 previous years. In particular, the detection, analysis, and warning of severe storms have improved considerably over these years. We have an excellent staff that takes a lot of pride in performing well above the norm. The table below is a valid illustration of how our office has performed its main purpose..."the protection of life and property". This chart applies to tornadoes and severe thunderstorms. Values are in percentages except Lead Time is in minutes. POD is Probability of Detection; FAR is False Alarm Ratio; CSI is Critical Success Index.

	1995	1996	1997	1998	1999
POD	67	85	93	86	91
FAR	55	44	43	62	24
CSI	37	51	55	36	65
LEAD TIME	15	21	24	20	17

In 1999, the Morristown WFO ranked 5th in the U.S. and 1st in the Southern Region. Our staff did an outstanding job overall with severe storms in 1999. We issued a total of 281 warnings and verified 212 of them. In addition, we issued Flash Flood Warnings for 40 counties and verified 11 of them. Our goal is to continue to improve in these areas.

Please use the information contained in this pamphlet to prepare for upcoming severe weather season. Severe thunderstorms and tornadoes can occur anytime of year, but are most prone in the spring and early summer. Review now can pay big dividends later.

For more information contact Howard Waldron at (423) 586-8706 or Jerry McDuffie at (423) 586-6429

Severe Thunderstorm Day

Monday, February 21, 2000

Severe thunderstorms can strike any time of the year. Severe thunderstorms and tornadoes, are more frequent in the spring months of March, April and May. Tennessee also has a "secondary" severe weather season in November and December. Severe thunderstorms can, and do, occur anytime of the day and night and during any month of the year.

Damaging thunderstorm winds are much more common in Tennessee than tornadoes.

The National Weather Service defines a thunderstorm as “**severe**” when wind speeds reach **58 mph (50 kts)** or stronger and/or 3/4 in hail (or larger) falls from the storm. Winds from severe thunderstorms can well exceed 100 mph, overturning trailers, unroofing homes, and toppling trees and power lines. Most of the storm damage in the Mid-South is caused by “straight line winds” from thunderstorm downbursts. Severe Thunderstorm wind speeds may exceed the wind speeds of a weak tornadoes. All thunderstorms are capable of producing deadly lightning.

PLEASE NOTE:

Severe thunderstorms can produce tornadoes with little or no warning!!

Severe Thunderstorm Safety Rules

FIND SHELTER IMMEDIATELY. Go to a sturdy building that will withstand high winds. Avoid electrical appliances, metal pipes and corded telephones.

When a **Severe Thunderstorm Warning** is

issued for your location, treat it the same as you would a **Tornado Warning**. Remember that severe thunderstorms can produce damaging winds, large hail and deadly lightning.

Hail Size Estimates (Diameter in inches)

Pea..... 1/4 inch	Golfball..... 1 3/4 inch
Penny..... 3/4 inch	Tennis Ball... 2 1/2 inch
Quarter..... 1 inch	Baseball..... 2 3/4 inch
Half Dollar.. 1 1/4 inch	Grapefruit... 4 inch

Wind Speed Estimates

Speed (MPH)	Effects
25-31	Large branches in motion; whistling in telephone wires
32-38	Whole trees in motion
39-54	Twigs Break off of trees; wind impedes walking
55-72	Damage to chimneys and TV antennas; pushes over shallow rooted trees
73-112	Peels surface off roofs; windows broken; trailer homes overturned
113+	Roofs torn off houses weak buildings and trailer homes destroyed; large trees uprooted.

Lightning

The Underrated Killer

Tuesday February 22, 2000

EVERY THUNDERSTORM CONTAINS LIGHTNING.

What is Lightning?

The action of rising and descending air within a thunderstorm separates positive and negative electrical charges. Lightning results from the buildup and discharge of electrical energy between these positively and negatively charged areas. Lightning charges may reach as high as 100 million volts. This electrical charge is always searching for the path of least resistance to complete the circuit. Lightning will normally strike the tallest object in the area of the potential discharge. Tall trees, light poles and telephone lines are frequent

targets for lightning strikes. Lightning is always a potential killer. Whether the storm is a large spring-time severe storm or the more common afternoon variety, it contains this deadly killer. It may strike an isolated tree or an object out in the open, **or it may strike you.** Keep in mind that you do not have to be standing directly beneath a cloud to be hit. Lightning may strike many miles from the parent storm. **In an average year lightning will claim more victims than tornadoes or hurricanes!**

LIGHTNING SAFETY RULES OUTDOORS

Seek shelter inside a house, large building or an all metal vehicle with the windows rolled up (avoid convertibles).

If your hair stands on end and your skin tingles... lightning is about to strike. Take cover immediately.

If you can't find appropriate shelter, get down to avoid being the highest point for a lightning discharge. When caught in the open, seek shelter in a low area. Crouch down and cover your head with your hands. If you are with a group of people, everyone should scatter out before crouching.

If caught in a wooded area seek out the area with the smallest trees. Stand at least five feet

flying bark, should the tree be hit by lightning.

When boating, head for shore and get into a shelter, or vehicle. If caught in a boat, lie down in the boat with cushions between you and the boat's side and bottom.

AVOID

Large trees, hilltops and other high places.

Chain link fences and any other metal fences like those around ball parks and play grounds.

Motorcycles, scooters, golf carts, small metal sheds, bicycles, tractors and farm equipment that does not have an enclosed metal cab.

from the trunk of the nearest tree to avoid

LIGHTNING SAFETY RULES INDOORS

Stay away from windows. Avoid telephones and electrical appliances (wires connecting to these devices run outside of the home and act as lightning rods).

Unplug computers and other sensitive electrical devices (time permitting) since surge suppressors may not protect these items if lightning hits close to the home.

Remember, there is no truth to the old myth that “lightning never strikes twice.”

Take time this week to learn or refresh your memory on lightning safety rules. That quick dash out in the open when a thunderstorm is in progress may unnecessarily expose you to the possibility of being struck. It is not worth the risk.

If a person is struck by lightning, there is no residual charge left on the body. The quick application of CPR may maintain vital body functions until medical help can be obtained.

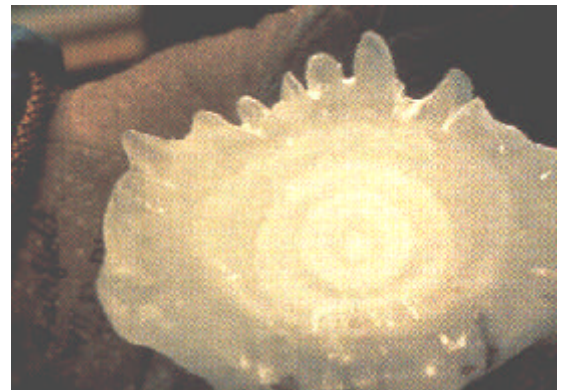


Large Hail - An Added Hazard

The strong rising currents of air within a storm, called updrafts, carry water droplets to a height where freezing occurs. Ice particles grow in size and become too heavy to be supported by the updraft and then fall to the ground as hail. Large hailstones may fall at speeds faster than 100 mph. Light reflecting from the large hail high up in the storm often gives the storm an eerie yellow green color. This is an indication that this storm may be strong.

Hail rarely causes deaths, but injuries do occur. If you are outside, move inside a building or

a car with a hard top. Make sure that outdoor pets and other animals have access to shelter.



TORNADO AWARENESS AND DRILL DAY

WEDNESDAY FEBRUARY 23, 2000

TORNADOES...WHAT ARE THEY?

NATURE'S MOST VIOLENT STORMS!

A **TORNADO** is a violently rotating column of air extending from the base of the thunderstorm and in contact with the ground (when it is not in contact with the ground, it is called a **FUNNEL CLOUD**). Tornado winds average 100 mph, but can exceed 300 mph. The strongest tornadoes develop from severe thunderstorms in atmospheric conditions with a wind profile that varies with height. Severe thunderstorms and tornadoes occur most often in the Mid-South in the months of March, April, and May. A secondary season occurs in the Fall, typically November and December. Most tornadoes occur in the afternoon and evening. However, tornadoes have occurred in every hour of the day and night and every month of the year. No time of day or year is immune to tornado occurrences.



Your Safety will improve if you stay alert to the risk of tornadoes from thunderstorms that approach. This is especially true if a **TORNADO WATCH** is in effect. Conditions should be carefully monitored when severe thunderstorms are occurring, or are expected to occur.

Severe Thunderstorms can produce tornadoes with little or no warning.

Know the difference between a

TORNADO WATCH and a TORNADO WARNING.

A TORNADO WATCH

means tornadoes may develop, so keep an eye to the sky for thunderstorms and the dangers they pose. Listen to NOAA Weather Radio, commercial radio, or TV for weather statements or warnings. A **WATCH** allows time to plan what to do if a tornado approaches. A watch usually spans several thousand square miles, and can cover parts of more than one state.

A TORNADO WARNING

means a tornado has been sighted, or is indicated on weather radar.

Persons in the path of the tornado should seek shelter immediately.

Drill Day
WEDNESDAY, FEBRUARY 23, 2000
9:00 - 9:30 LOCAL TIME

A TORNADO DRILL will be conducted Wednesday morning, February 23, 1999, between 9:00 AM and 9:30 AM **Local Time**, weather permitting, as part of SEVERE WEATHER AWARENESS WEEK in Tennessee. If Wednesday's weather is inclement, the test will be Friday, February 25, 1999 (same times).

Sometime during this hour, each National Weather Service office in the state will issue a drill message. These messages will be sent under the following NWS communication headers:

MENTORMEM, MENTORBNA and MENTORMRX. Media outlets with automated systems that relay these headers may want to take special actions to optimize relay of these test to meet their special needs on Drill Day.

The test message will be broadcast on all NOAA Weather Radio Transmitters across Tennessee and those transmitters in North Mississippi that cover Tennessee counties.

We ask television and radio stations to relay the drill message to the public in the same manner as you would relay an actual tornado warning. This will allow the complete "**Warning System**" to be tested. We ask local emergency management agencies to activate their warning system (radio alerting devices, outdoor sirens, etc.) to make sure they work as expected.

A Drill such as this gives schools, churches, business offices and plant safety managers across the state a chance to check the readiness of their Severe Weather Safety plans. If your office has a plan already in place, test it to make sure your employees know how to respond properly. If your employees know how the safety procedures work, they can carry them out effectively when the time comes.

IF YOUR WORK PLACE, SCHOOL OR CHURCH DOES NOT HAVE A SAFETY PLAN, NOW IS THE TIME TO START ONE!! Developing a safety plan is not difficult. If a plan is easy to operate, it is more likely to be successful when needed. Countless lives are saved each year by planning, preparedness and proper education. The U.S. population has grown in recent years, yet the number of tornado deaths has diminished. This is due to agencies and individuals developing Weather Safety Plans and to people reacting in a prudent manner when severe weather threatens their areas.

**YOUR SAFETY AND THAT OF YOUR FAMILY, FRIENDS & CO-WORKERS DEPENDS
ON YOU!!**

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Flash Flooding and River Flooding

Thursday, February 24, 2000

Flooding and Flash Flooding are the number one weather related killer!

Most flood deaths occur at night and when people become trapped in automobiles that stall in areas that are flooded

Flash floods occur within a few minutes or hours



after excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam or mud slide. Flash floods can tear out trees and destroy buildings and bridges.

Because flash floods happen in a short period of time, generally less than six hours, they are more life threatening than general floods or river flooding. Areas most susceptible to flash flooding are mountainous streams and rivers, urban areas, low-lying areas, storm drains, and culverts. The mountain regions of middle and east Tennessee have potentially more flash flood problems than west Tennessee but all parts of the state are susceptible.

The National Weather Service issues a **Flood or Flash Flood Watch** when conditions are detected that can result in flash flooding within a designated area, but the occurrence is neither certain nor imminent.

Persons in the watch area are advised to check flood action plans, keep informed, and be ready to take action if a warning is issued or flooding is observed.

A Flash Flood Warning is issued when flash flooding has been reported or is imminent. It focuses on specific communities, streams or areas where flooding is imminent or occurring. Persons in the warned area are advised to take necessary precautions immediately.

RIVER FLOODING: This type of flood is caused by an increased water level in an established watercourse, such as a river, creek, or drainage ditch. River flooding is generally slower to develop than flash flooding. There can be exceptions to this, especially with some smaller rivers where the time lag between the runoff from heavy rain and the onset of flooding can be very short. This can be the case with several east Tennessee rivers and streams. On the other hand, it may take several days for a flood crest to pass downstream points on major rivers.

The National Weather Service issues **River Flood Warnings** when rivers are expected to rise above flood stage. River stages and crest forecasts are given for selected forecast points along with known flood stages for each forecast point. While there is usually more advanced warning time with river floods than with flash floods, persons should be familiar with the flood prone areas they live and work in, and must know what action to take and where to go if a flood occurs. Advance planning and preparation is essential.

FLOOD SAFETY RULES:

- < Get out of areas subject to flooding. These include dips, low spots, stream beds, drainage ditches and culverts. If caught in low areas during flooding, go to high ground immediately.
- < Avoid already flooded and high velocity flow areas. A rapidly flowing stream or ditch can sweep you off your feet or even sweep your car downstream.
- < Be especially cautious at night when it is harder to recognize flood conditions.
- < Do not drive through flooded areas. The road bed may be washed away.
- < If your vehicle stalls, abandon it immediately and seek higher ground. The rising water may engulf the vehicle and the occupants inside.
- < Do not camp or park your vehicle along streams or washes during threatening conditions.
- < When a Flash Flood WARNING is issued for your area act quickly to save yourself. You may only have seconds.
- < **GO TO HIGHER GROUND - CLIMB TO SAFETY!**



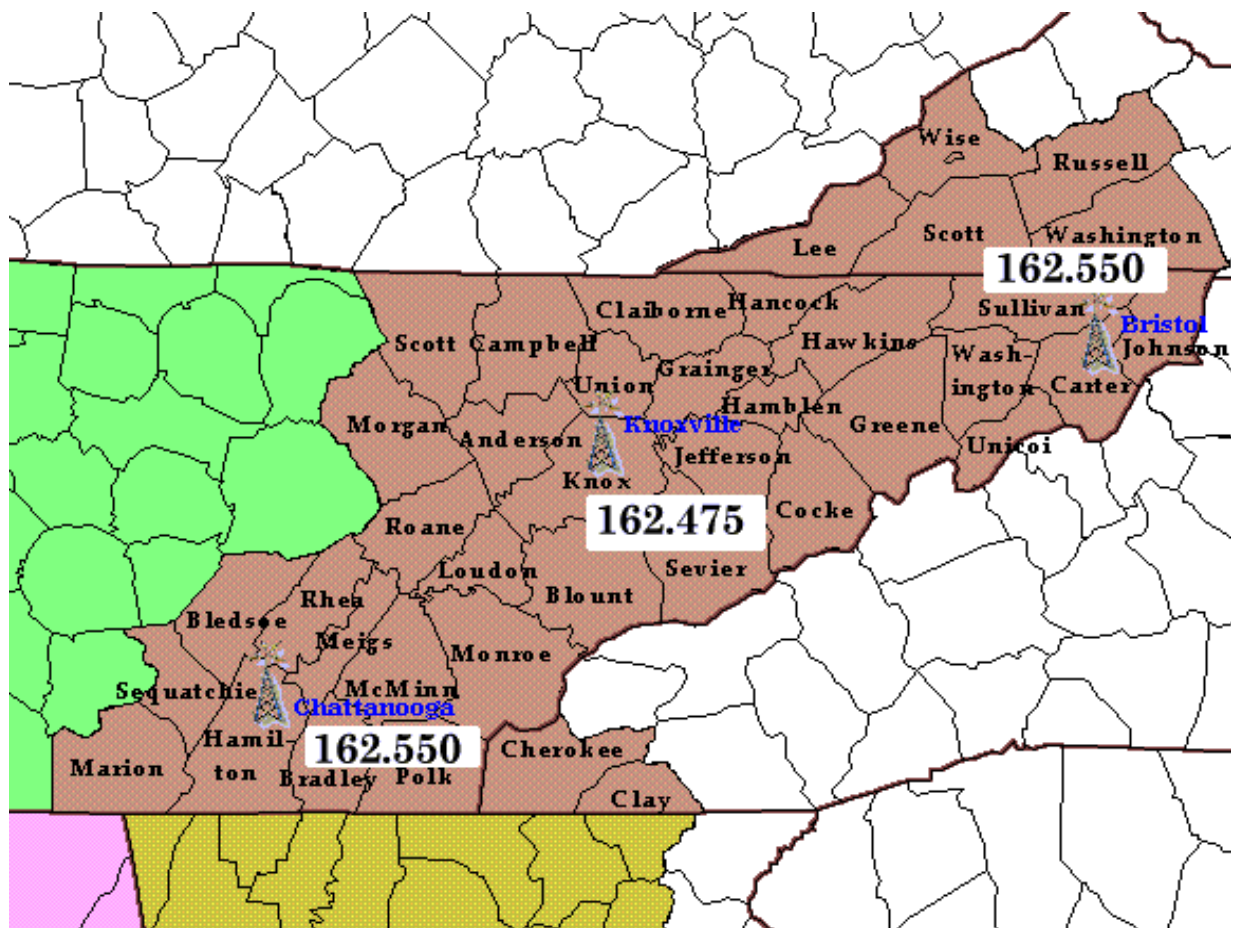
Planning - The Key to Your Survival During Severe Weather

Friday, February 25, 2000

NOAA Weather Radio is an excellent way to receive WARNINGS from the National Weather Service. The National Weather Service continuously broadcasts updated weather watches, warnings and other weather information 24-hours a day. Affordable (\$20-\$30) radios can be purchased to receive weather broadcast on 162.400, 162.475 and 162.550 MHZ. These radios usually have several other frequencies in the same range for receiving information from National Weather Service offices in other areas transmitting on 162.425 MHz, 162.450 MHz, 162.500 MHz and 162.525 MHz.

The Newer **S.A.M.E.** (Specific Area Message Encoder) radios are capable of being alerted for a specific county or up to 15 separate counties. This avoids the older technology's limitation of alerting the entire listening area of the radio transmitter. Newer models are even capable Separate programs for specific threats such as tornado warnings, Severe Thunderstorm Warnings and Flash Flood Warnings.

Tennessee Valley NOAA Weather Radio Frequencies



****What to Listen For****

TORNADO WATCH:

Tornadoes are possible in the designated WATCH area. Remain alert for approaching storms. Keep track of the latest forecasts and be ready to take cover if severe weather threatens.

TORNADO WARNING:

A tornado has been sighted or indicated by Doppler Weather Radar. Warnings mean that severe weather is occurring!! **TAKE COVER IMMEDIATELY!!**

SEVERE THUNDERSTORM WATCH:

Severe Thunderstorms are possible in the designated WATCH area.

SEVERE THUNDERSTORM WARNING:

Severe Thunderstorms are occurring. Move to your planned place of safety. **Remember, Severe Thunderstorms occasionally produce tornadoes with little or no warning!!**

FLASH FLOOD or FLOOD WATCH:

Flash flooding or flooding is possible in the designated WATCH area. Be alert.

FLASH FLOOD or FLOOD WARNING:

Flash flooding or flooding has been reported or is imminent. Take necessary precautions at once.

URBAN and SMALL STREAM FLOOD ADVISORY:

Flooding of small streams, streets, and low-lying areas such as underpasses and urban storm drains is occurring

Fujita Intensity Scale (F Scale)

This scale is named after Dr. T. Fujita, the noted meteorologist who has studied tornadoes extensively and classified the damage created by these storms.

F Scale	Speed	Damage Threat
F0 (weak).....	40-72 mph	Light damage...shallow rooted trees pushed over.
F1 (weak).....	73-112 mph	Moderate damage...mobile homes overturned; roof surfaces peeled off.
F2 (strong).....	113-157 mph	Considerable damage...large trees uprooted...mobile homes destroyed
F3 (strong).....	158-206 mph	Severe damage..trains overturned; well built homes lose roofs and walls

Saturday, February 26, 2000

SKYWARN

The eyes and ears of National Weather Service in the field

SKYWARN is the program developed by the National Weather Service to recruit and train storm spotters. SKYWARN spotters enhance the National Weather Service's storm detection capabilities by identifying and reporting potentially dangerous weather conditions. The SKYWARN program has become an invaluable link in the NWS warning process.

Despite all of the sophisticated technology used in a modern NWS office, forecasters still rely on storm spotters. Doppler radar may indicate that a storm may be producing large hail, damaging winds or even a tornado, but it cannot tell exactly what's happening on the ground underneath the storm. Storm spotters, trained by NWS meteorologists, act as the eyes and ears of the NWS. Their reports, radar data and other information result in the most timely and accurate warnings possible.

SKYWARN spotters come from all walks of life - law enforcement, fire or emergency management agencies and citizens interested in helping their communities. A large number of storm spotters are amateur radio operators, who volunteer their time and equipment to help the NWS detect and track severe storms. Amateur radio operators, or "hams", will frequently man radio equipment at the local NWS office, gathering reports from spotters in the field and relaying the data directly to NWS forecasters. SKYWARN spotters are volunteers - they receive no compensation for their hard work. They do, however, have the satisfaction of knowing that their reports result in better warnings which save lives. For more information on SKYWARN, or to schedule a storm spotter class in your area, contact the nearest office of the National Weather Service.

National Weather Service Internet Home Page Information

Morristown

www.srh.noaa.gov/mrx

Nashville

www.srh.noaa.gov/ftpboot/ohx/html/ohx.html

Memphis

www.srh.noaa.gov/meg

Interested in getting additional weather data?

Emergency Managers Weather Information Network EMWIN

The National Weather Service has a new method of distributing weather information on a national basis. EMWIN information is distributed as a data signal relayed through the weather satellites. Software allows your personal computer to display weather information 24 hours a day.

The main purpose of the EMWIN is to provide timely warnings of approaching severe weather. EMWIN prioritizes the data with warnings and severe weather summaries transmitted first. Routine weather, satellite images and weather graphics are also transmitted. The service is public information and is free - there are no monthly fees to receive the data. The only cost is for the receiving equipment and inexpensive commercial software.

The software to display the EMWIN data runs under Windows 3.1 or Windows 95 and takes

about 20MB of hard disk space. Several companies provide reasonably priced (\$600-\$1,000) satellite receivers to capture the EMWIN signal. Efforts are being made to receive the EMWIN satellite data and retransmit it on a UHF/VHF frequency. This would allow anyone with a computer and a radio receiver to get EMWIN data for a one-time cost of around \$200. Check your closest National Weather Service Office home page for more information as these systems become operational.

EMWIN data is not intended to replace any existing weather dissemination systems. EMWIN will be a cost effective system for supplementing NOAA Weather Radio Data and other systems where a full suite of data is not needed. Call your local National Weather Service office for EMWIN activities in your area.

Severe Weather Awareness Week

National Weather Service
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